UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Response to Comments
submitted by
Seneca Nation of Indians
for
The Issuance of an Underground Injection Control (UIC) Permit
For
Roulette Oil & Gas, LLC
EPA Permit No. PAS2D050BPOT

1. COMMENT: *The Proposed Injection Well has the possibility of causing the incidental loss of or damage to cultural resources, including those of significance to the Seneca Nation. The EPA should require compliance with the National Historic Preservation Act ("NHPA"), specifically Section 106 (36 CFR Part 800), which would minimize and mitigate impacts requiring a cultural resource investigation. Consultation with the Seneca Nation and interested parties on this cultural resource investigation will ensure compliance with the regulations of the NHPA. Special buffers or protections necessary for the protection of historic or cultural resources can be determined based on individual site conditions.*

RESPONSE: In order to fulfill its obligations pursuant to the National Historic Preservation Act, 54 U.S.C. § 300101 *et seq*. (NHPA), and in accordance with the NHPA Section 106 review process and its 36 C.F.R. Part 800 implementing regulations, the EPA took the initial step of seeking to determine whether this particular undertaking had the potential to cause adverse effects to historic properties. The undertaking in this matter involves converting an existing oil and gas production well to a Class II-D disposal injection well and requires no land disturbance, of any kind, to the well itself, the well pad or access roads. In accordance with the NHPA Section 106 review process, EPA determined that this activity did not have the potential to affect any historic properties, including properties of traditional religious and cultural importance to an Indian tribe and that meet the National Register criteria, or artifacts, records, and remains that are related to, and located within, such properties. EPA therefore concluded, pursuant to 36 C.F.R. § 800.3(a)(1) requirements, that it did not have any further NHPA-related statutory or regulatory obligations or authorities. EPA's determination in this matter is consistent with the general position expressed by the State Historic Preservation Officer that activities of this type did not have a potential to affect historic properties.

2. COMMENT: *Only a limited number of states (10) have actually permitted hazardous waste disposal wells. Even though Class II wells disposing oil and gas industry waste are exempt from being classified as toxic or hazardous under current federal law, they are*

indeed HAZARDOUS to human health and the environment. Permitting UIC Class II wells for disposal fails to protect safe drinking water and human health in the long-term.

RESPONSE: Individual constituents contained within fluid produced from an oil and/or gas production reservoir potentially could be toxic or hazardous. However, these fluids, when produced in association with oil and gas production, are exempt from hazardous waste regulations and are not classified as hazardous under the Resource Conservation and Recovery Act, 42 U.S.C. § 6901 et seq. (RCRA). EPA believes that these large volume "special wastes" are lower in toxicity than other RCRA regulated hazardous wastes and, in December 1978, EPA proposed hazardous waste management standards that included reduced requirements for several types of large volume wastes. Congress initially exempted these wastes from RCRA Subtitle C (*i.e.*, hazardous waste) regulatory requirements pending a further study and regulatory determination by EPA. In 1988, on the basis of further study and scientific review, EPA issued a regulatory determination that the control of oil and gas exploration and production wastes under RCRA Subtitle C was not warranted. Therefore, waste fluids produced in association with oil and gas production activities are not regulated as hazardous wastes by the Agency and the disposal of these fluids into a Class II brine disposal injection well is permissible under the regulatory provisions of the federal UIC Program.

3. COMMENT: *Class II well construction is not rated for containment of hazardous materials. Class I wells require at least 2 layers of concentric casing and cement, an outer (or surface) casing cemented to the surface and tests during drilling to ensure no vertical migration of fluid. In contrast, Class II wells are only required to be cased or cemented to prevent movement of fluids into drinking water sources without specific design criteria. Federal UIC Class II statutory mandates are inadequate and fail to address the hazards associated with the oil and gas industry operation, and protection of human health and the environment should be prioritized. There is no measurable assurance water resources are protected.*

RESPONSE: A provision of the UIC regulations, 40 C.F.R. § 147.1955(b)(1), requires an injection well's surface casing to be placed 50 feet below the determined lowermost underground source of drinking water (USDW). **(Note: The UIC program defines a USDW as any aquifer system having less than 10,000 mg/l total dissolved solids (TDS), that is currently used, or could be used in the future. This definition is more stringent that the Pennsylvania Department of Environmental Protection (PADEP) definition that requires protection of the "deepest fresh water".)** The surface casing must also be cemented to the surface. The surface casing is an impermeable steel casing that encapsulates the long string casing and injection tubing and prevents fluids from entering or leaving the borehole. The lowermost USDW, where the proposed injection well will be located, is found at a depth of approximately 340 feet. The permit will require surface casing to be placed to a depth of approximately 501 feet and be cemented back to the surface. 25 Pa. Code § 78.83 similarly incorporates protective casing and cementing procedure requirements, including a requirement that the operator to "drill to approximately 50 feet below the deepest fresh groundwater". 25 Pa. Code § 78.83(c). The depth of the surface casing in the proposed injection well exceeds both federal and state requirements. In addition, the Draft Permit requires long string casing to be set above the shallowest injection zone, approximately 1,460 feet below ground surface and cemented back to the ground surface. Injection tubing and packer (a device lowered into the well to produce a fluid-tight seal) is then set inside the long string casing and injection occurs through the tubing

and packer. This construction provides three layers of protection for the USDWs. Roulette will also be required to obtain a UIC permit from PADEP and meet any additional well construction requirements required by the PADEP.

The American Petroleum Institute (API) (*see* www.api.org) and oil and gas service companies have developed industry standards for casing and cementing wells. In addition, brine disposal injection wells are required to be mechanically tested to ensure integrity before they are operated, and many are continuously monitored after testing to ensure that mechanical integrity is maintained.

The casing in the proposed well is designed to withstand both significant internal and external pressure. Prior to operation, EPA requires that the proposed well be tested for mechanical integrity. Cementing records and logs are required to show that the well has adequate cement to prevent fluid migration out of the injection zones and an internal pressure test is required to ensure the casing, tubing and packer will not leak during the well's operation. The internal pressure test requires the annulus of the well (the space between the production casing and the tubing and packer) to be pressure tested to ten percent above the permitted maximum allowable injection pressure (974 psi) and held for at least 30 minutes, with no more than a five percent loss in pressure allowed. The well will shut down if a seismic event that affects its mechanical integrity were to occur, because the well will be designed to automatically cease operation if there is a mechanical integrity failure. There is no fault system present that would allow for the migration of fluid out of the injection zone.

The UIC program in EPA Region III has been utilizing the construction and testing standards discussed above for disposal wells in Pennsylvania since it started implementing the UIC program in June 1984. EPA continues to find that these requirements effectively protect USDWs from the subsurface injection of Class II fluids.

4. COMMENT: *The Proposed Injection Well has the potential to affect precious pristine headwaters of the Allegheny River, a concern since shale gas wastewater is often considered the dirtiest processed water on earth. Failures and even normal operations increase the risk of toxic chemical and radioactive contamination of surface and groundwater. While groundwater contamination is the primary concern, there are also related risks to surface water (explosions, spills related to transport and storage, etc.).*

RESPONSE: Naturally occuring radioactive material or "NORM" are radioactive compounds that exist naturally at low levels in soils and rocks. Some oil and gas production fluids may contain these radioactive byproducts (*i.e.*, Ra-226 and Ra-228) depending upon the geologic formation from where the fluid has been produced. For example, fluids produced from shale tend to contain greater concentrations of natural radioactivity because of the clay content in the shale. However, the management and disposal of NORM wastes associated with the production of oil and gas are not federally regulated and EPA considers the injection of Class II fluids deep underground to pose minimal environmental risk and to be a safer alternative than other available methods of disposal, such as allowing them to be discharged into a stream, disposed of in a landfill or treated and stored in containment pits or storage tanks. EPA also characterizes the reuse or recycling of produced fluid as a sound environmental management practice. Public and privately owned wastewater treatment facilities are unable to adequately remove many constituents found in brine, for example, chlorides and bromides. When these

constituents are discharged to streams or rivers, they can pose serious risk to fish and other aquatic organisms living in the stream as well as contribute to serious health effects for people who obtain their drinking water from these streams and rivers. The UIC permitting program is designed to provide an alternative through which injection activities may occur in a regulated and environmentally protective manner which ensures that best management practices are identified and employed.

5. COMMENT: *Even one spill or failure at the Proposed Injection Well could have severe consequences. There is no way to clean up contaminated groundwater other than natural attenuation, and attenuation of radioisotope contamination would take more than 1,000 years.*

RESPONSE: EPA understands the Seneca Nation's concerns regarding potential spills at the well surface. However, EPA, through its UIC Program, only has jurisdiction for the permitting of subsurface injection activities. Surface spill prevention cannot be addressed through the UIC permitting process. Surface disturbances, fluid containment and spills which could occur on the injection well site are all regulated by PADEP, which is the State agency responsible for all surface construction and spill prevention at the proposed well site. Title 25, Chapter 78, of the Pennsylvania Code requires the well operator to report any surface spills or releases of brine to PADEP. There may also be local or county ordinances or regulations that address surface spill prevention. When making the decision on whether to issue a UIC permit, EPA's jurisdiction rests solely in determining whether the proposed injection operation will safely protect underground sources of drinking water (USDWs) from the subsurface emplacement of fluids. Since 1984, there has been no reported injection well contamination of USDWs as a result of EPA Region III permitting actions.

6. COMMENT: *The capacity of the Allegheny watershed to handle existing and proposed oil and gas development has never been assessed and yet cumulative impacts of oil and gas related activities in the upper Allegheny watershed have a direct effect on the Allegheny River and Seneca Nation Territory. The permit fails to consider long term cumulative impacts.*

RESPONSE: The UIC regulations were designed to protect USDWs and the UIC Program only provides EPA with the authority to regulate subsurface injection activities within the oil and gas sector. The Draft Permit adheres to the UIC Regulations, found in 40 C.F.R. §§ 144-147, which address subsurface injection activities and provide a regulatory scheme which ensure the occurrence of thorough and proper citing, casing, monitoring, and confinement activities that are protective of USDWs. The Cooper 5-0, Sheffield 3-1 and Kane 3-0 formations have been studied by the Permittee and have shown capacity to accept produced fluids from the Permittee's oil & gas operations. While other state, county, and/or local jurisdictions may further study and regulate any additional, or cumulative impacts that oil and gas related activities may have in the upper Allegheny River watershed, EPA lacks the jurisdictional ability to do so under the UIC Permitting Program.

7. COMMENT: *ROGC has 437 oil and gas wells across six counties, with 274 located in Potter County. Their Application states that brine intended for disposal will come from 110 of their conventional oil and gas wells. However, no information was provided that guarantees only waste from those wells would be injected; that is, whether or not (sic)*

waste from unconventional shale gas wells or other companies will be accepted. It appears that ROGC principals are also principals for the oil & gas companies "Potter-McKean Resources of PA" and "Simon of Bolivar Enterprises." No information is provided on whether or not waste from these ROGC-associated companies will be accepted at the Proposed Injection Well. Likewise, no information was provided regarding the capacity of the Proposed Injection Well (daily/annual, etc.).

RESPONSE: The UIC Draft Permit Number PAS2D050BPOT states that the Permit authorizes Roulette Oil & Gas to "construct and operate a Class II-D disposal injection well… for the purpose of injecting fluids *produced solely in association with oil and gas production from Roulette Oil & Gas Co., LLC*". (Emphasis supplied). The Draft Permit is not a commercial Permit; therefore the only fluids that Roulette will be allowed to inject into the proposed Clara Field 20 injection well are disposal fluids produced as a byproduct of Roulette's own oil and gas production activities and not from Potter-McKean Resources of PA or Simon of Bolivar Enterprises. In addition, the Draft Permit requires that the injection fluids must be classified as Class II fluids, which are primarily brines (salt water) that are brought to the surface while producing oil and gas. Wastewater from hydraulic fracturing activities, including the brines that are separated from hydrocarbons at the surface, can be injected into Class II wells. The fluids injected into the proposed Clara Field 20 injection well are limited by the Draft Permit to Class II fluids produced by Roulette Oil & Gas.

8. COMMENT: *ROGC's Application (Attachment J: Business Description) notes that "Gas is produced from approximately 300 wells in Potter County… ROGC also produces oil in McKean County, PA and Allegany County, NY." But according to the most recent PADEP Oil & Gas Production Report, it appears that ROGC also has multiple active gas wells in Elk County, PA, and McKean County, PA, so the proposed permit may implicate wastewater from more wells than just those located in Potter County.*

RESPONSE: As noted in EPA's response to the previous comment, the Draft Permit neither specifies nor prohibits the injection of productions fluids from particular production wells. However, the Draft Permit does require that all injected disposal fluids must have been produced solely in association with Roulette's own oil and gas production activities and that they meet the definition of a Class II fluid. In addition, Paragraph II.C.4. of the Draft Permit requires Roulette, the Permittee, to "monitor the nature and composition of the [fluids] injected into the Injection Well by sampling, analyzing, and recording the injection fluid… whenever the operator observes or anticipates a change in the injection fluid".

9. COMMENT: *There are increased risks due to structural deficiencies of Clara field well #20:*
    a. *It is necessary to determine the possible influence of the surrounding wells on the effectiveness of the Proposed Injection Well (pressures, failures, and groundwater contamination, etc.).*
    b. *It is imperative to assess the condition of Clara field wells #11, 19 & 20 and other wells within a 1-mile radius of Clara field well #20 as opposed to the standard ¼ mile radius.*
    c. *ROGC's record of noncompliance with regulations and Pennsylvania Department of Environmental Protection's limited enforcement record at the existing conventional wells in the Clara Field (few inspections) do not*

instill confidence that the Proposed Injection Well will be operated or monitored safely.

RESPONSE: a. Clara Field Well Nos. 11 and 19, the only two wells reported within the Area of Review (AOR), will act as monitoring wells for the proposed Clara Field 20 injection well. According to production records from the PADEP, Clara Field Well Nos. 11 and 19 both produced natural gas from the injection formations in 2019. EPA reviewed how these two wells were constructed from the completion reports submitted by the Applicant and found that both of these wells were constructed with the correct casing materials and met all PADEP casing and cementing requirements and specifications. EPA considers the availability and use of Clara Field Well Nos. 11 and 19 for Clara Well #20 monitoring purposes to be especially advantageous because their prior existence and proximate location to the proposed injection well make them particularly well-suited for monitoring the fluid level in the injection zones (to confirm that the ¼- mile AOR is adequate) and to ensure that fluid does not migrate into USDWs. The fluid level is representative of the pressure within the injection formation.

b. In accordance with applicable UIC regulatory requirements found at 40 C.F.R. § 146.6, Roulette Oil & Gas has permissibly elected to use the ¼-mile fixed radius for the AOR associated with the proposed Clara Field 20 injection well. In doing so, Roulette Oil & Gas was required to document the status (active or inactive / plugged / unplugged) and type of wells that are currently present within the AOR and to provide
EPA with completion reports for those wells for review. In conducting such a review, EPA seeks to determine whether those wells present in the AOR have been properly sealed, completed, and/or abandoned and whether any wells within the AOR that penetrate the injection zone might serve as conduits for fluid migration into USDWs. If EPA identifies any improperly sealed, completed or abandoned wells within the AOR, EPA will require the Permittee to submit a corrective action plan detailing those steps or modifications deemed necessary to prevent movement of fluid into USDWs and require the implementation of such measures. Upon review of each of the AOR well completion reports submitted by Roulette Oil & Gas with its Clara #20 permit application, EPA has confirmed that Well Nos. 11 and 19 are active production wells and EPA finds their construction and condition to be satisfactory. The UIC regulations do not mandate the plugging of an operational well within, or outside, the AOR and EPA does not consider those actions necessary to protect human health or the environment.

c. EPA understands the commenter's expressed concerns over the applicant's compliance history in the Commonwealth and with perceived deficiencies in associated enforcement responses. While EPA does not possess the requisite authority to enforce the Commonwealth of Pennsylvania's oil and gas regulations (that authority rests solely with the PADEP), EPA does have direct implementation and enforcement authority for the UIC program in Pennsylvania. EPA's UIC Program obligations and authorities include injection well permitting, the performance of compliance evaluation inspections and the initiation of appropriate enforcement activities when warranted. EPA Region III has a team of UIC inspectors, including one full time inspector whose sole responsibility is to perform Class II underground injection well inspections. At least one EPA inspector will be present to witness the mechanical integrity tests conducted on the Clara Field 20 injection well and EPA will, at a minimum, inspect the well, during operation, on an annual basis. EPA reviews each injection well operator's annual report and the continuous monitoring reports of pressure and injection fluid volumes that each operator must submit to the Agency. Instances of operator noncompliance may subject any operator to an appropriate and responsive EPA enforcement action and associated penalties.

10. COMMENT: *More information is needed regarding the quality of the wastewater that will be accepted. The Application mentioned TDS concentration would be 173K mg/L but doesn't discuss other major wastewater contaminants such as nutrient, heavy metals, surfactants and radioisotopes. The chemical and physical analysis of the injection fluid is insufficient to be protective of water resources. Safe drinking water is compromised due to the lack of regulatory standards to protect it.*

RESPONSE: Individual constituents within the fluid produced from an oil or gas production reservoir potentially may be toxic, hazardous, or radioactive. However, Congress exempted oil and gas production fluids from hazardous waste regulation and such production wastes are not classified as hazardous under the Resource Conservation and Recovery Act (RCRA). As a result, EPA lacks the authority to regulate those fluids produced in association with oil and gas production activities as hazardous waste and the disposal of these fluids down a Class II brine disposal injection well is legally permissible. One of the major reasons behind the development of the UIC Program was to provide an alternative regulatory scheme whereby oil and gas related fluids could be safely managed and prohibited from uncontrolled discharge into a stream or a river or from overflow and/or seepage into the ground from above-ground containment pits. Please note that RCRA-regulated hazardous wastes produced by the petrochemical and other industries have been safely injected underground since the UIC regulations went into effect in the early 1980s. These fluids are injected down Class I hazardous waste injection wells below the lowermost USDW. The mandate of the UIC program is to protect USDWs from the subsurface emplacement of fluids. EPA faithfully seeks to fulfill this mandate through UIC Program requirements that include strict well construction criteria, the testing and inspection of injection well operations, monitoring and reporting requirements, and environmentally protective plugging and abandonment requirements.

11. COMMENT: *The ancillary effects of the Proposed Injection Well will include an increase in trucks, noise, road damage, and surface and groundwater pollution. The construction of a large industrial site in a rural community will have everlasting effects. Residents utilize groundwater as their primary source of drinking water. The local economy is dependent on the current high quality of the environment.*

RESPONSE: The EPA UIC program lacks the regulatory authority to address the potential for increased truck traffic, roadway damage or increased noise. EPA's jurisdiction rests solely in determining whether the proposed injection well and the way it is operated will safely protect USDWs from the subsurface emplacement of fluids. While each of these expressed concerns are relevant, appropriate and important to local residents and businesses, they cannot be addressed within the context of a UIC permit. However, concerns such as these may properly be addressed at the local or county levels of government, through citizen requests for appropriate amendment to local or county ordinances that may directly address and regulate local and/or regional traffic, road, and noise concerns. It is important to note that every UIC permit that EPA Region III issues provides that the Permittee must meet all state and local laws and regulations. Paragraph I.A. of the Draft Permit contains just such a provision, which clearly states that "Issuance of this Permit does not convey property rights or mineral rights of any sort or any exclusive privilege; nor does it authorize injury to any persons or property, any invasion of other private rights, or any infringement of State or local law or regulations". In addition, Paragraph I.D.12. of the proposed permit instructs that "Nothing in this Permit shall be construed to

preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation". Therefore, the UIC permit represents only one of any number of potential authorizations, regulatory requirements, and legal provisions that a Permittee may be required to obtain, comply with, and adhere to, in order to commence, continue and remain in operation. Even subsequent to obtaining EPA authorization to operate a UIC injection well, these additional legal requirements afford local citizens an effective and continuing means through which they may air grievances and seek to redress perceived instances of noncompliance with ongoing UIC Program requirements, applicable State laws and other, local regulations.

12. COMMENT: *Special Status Species – the EPA should require ROGC to identify any and all special status species that would be affected by habitat loss and fragmentation and disruption from noise and traffic at the Proposed Injection Well site. Likewise, the EPA should require ROGC to comply with the EPA and USFWS guidelines for mitigating or reducing impacts on special status species. All plans should seek to reduce the risk of habitat loss and species. Special buffers or protections necessary for historic or cultural resources should be determined based on individual site conditions. The current Application lacks sufficient information to make these determinations with respect to special status species.*

RESPONSE: EPA is legally required to comply with Section 7 of the Endangered Species Act (ESA), 16 U.S.C. § 1536, for listed endangered or threatened species, proposed endangered species, or critical habitats. On November 4, 2020, EPA Region III conducted a search 1.08 mi^2 around the proposed injection well using the U.S. Fish & Wildlife's (US FWS) website, http://ecos.fws.gov/ipac/, to identify any endangered or threatened species. The list identified one threatened species, the Northern Long-eared bat (*Myotis septentrionalis*). There are no critical habitats found within the project area. The EPA made a determination that the proposed injection project will have no effect on the threatened species based on the fact that injection will take place from approximately 1,490 to 1,833 feet underground. The only way for injection fluid to impact species at the surface would be through a surface spill. The PADEP has jurisdiction over spill prevention associated with tanks, surface containment, etc. at the injection well. The UIC program does not have the authority to require Roulette to mitigate or reduce impacts on special species status due to habitat loss and fragmentation at the ground surface. The UIC program regulates those activities taking place in the subsurface to protect USDWs. However, nothing in the permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state or local law or regulation. In addition, during the public notification period, EPA directly sent the U.S. FWS Pennsylvania Ecological Services Field Office a copy of the Draft Permit, Statement of Basis, and EPA memo to file explaining EPA's determination that the proposed project would have no effect on threatened species proximate to the proposed injection well. The U.S. FWS Pennsylvania Ecological Services Field Office has submitted no responsive comments to EPA regarding this proposed project.

13. COMMENT: *Injection wells are based on unknown science; all assumptions that are made modeling flow into aquifers are based on natural geologic conditions.*

    a. *"'There is no certainty at all in any of this, and whoever tells you the opposite is not telling you the truth,' said Stefan Finsterle, a leading hydrologist at Lawrence Berkeley National Laboratory who specializes in understanding the properties of rock layers and modeling how fluid flows*

through them. 'You have changed the system with pressure and temperature and fracturing, so you don't know how it will behave.'"

b. *When injection wells intersect with production wells and abandoned wells, the combined effect is that many of the natural protections assumed to be provided by deep underground geology no longer exist. Additionally, migration of contaminants may be enhanced due to activities at other wells.*

c. *There are upwards of 2 million abandoned and plugged oil and gas wells in the U.S., more than 100,000 of which may not appear in regulators' records. Many abandoned wells are supposed to be sealed shut with cement, but studies show that cement breaks down over time, allowing seepage up the well structure.*

d. *Gaps have emerged between theories of how underground injection should work and how it works in practice. Rock layers aren't always neatly stacked as they appear in engineers' sketches. They often fold and twist over on themselves. Waste injected into such formations is more likely to spread in lopsided, unpredictable ways than in a uniform cone. It is also likely to channel through spaces in the rock as pressure forces it along the weakest lines.*

RESPONSE: a. UIC regulations found at 40 C.F.R. § 146.22(a) provide that the Permittee may only inject into a formation that "separated from any USDW by a confining zone that is free of unknown open faults or fractures within the [A]rea of [R]eview." The provisions of Draft Permit Paragraph III.B.4. also prohibit the Permittee from injecting "fluid at a pressure which initiates new fractures or propagates existing fractures in the confining zone, as defined in 40 C.F.R. §146.3, adjacent to USDWs or causes the movement of injection or formation fluids into an USDW." A confining zone is a geologic formation (usually shale) with low permeability and porosity, that overlays the injection zone and acts as a barrier to protect against the upward movement of injected fluids into USDWs. The proposed permit conditions were developed using applicable UIC regulations and available geologic, hydrogeologic and seismic research. The EPA used sound science as a basis to conservatively set permit conditions and limitations to ensure the protection of human health and the environment. The proposed permit limit for the surface injection pressure (974 psi) and the bottom-hole injection pressure (1,683 psi) was also conservatively calculated to ensure that, during operation, the injection will not propagate existing fractures or create new fractures in the formation (see Paragraph III.B.4, "Injection Limitation" for calculation details). Limiting injection pressure not only prevents the propagation of fractures that could become potential channels for fluid movement into USDWs but that could also serve as conduits for fluids to travel from the injection zone to known or unknown faults.

b. EPA Form 7520-6 and 40 C.F.R. §§ 144.31(e)(7) and 144.24(a)(2) required Roulette to provide a topographic map extending a ½-mile from the wellbore depicting the AOR along with: (1) the name and location of all production wells, injection wells, abandoned wells, dry holes, and all water wells, noting their types (public water systems, domestic drinking water, stock, etc.); (2) springs and surface bodies of water; (3) mines (surface and subsurface) and quarries, and; (5) other pertinent surface features, including residences, schools, hospitals, and roads. Required reports received from Roulette showed no abandoned wells within this ½-mile area. Each UIC permit applicant is also required to tabulate data available from public records or otherwise known to the applicant on all wells within the AOR which penetrate the injection zone. Each applicant must also note each well's type, construction,

date drilled, location, depth, and record of plugging and complete. Roulette reported the existence of three wells within the AOR and each of these three wells also penetrates the injection zone. These wells are identified as Clara Field 20 (the proposed injection well) and Clara Field 11 and 19, which as discussed above, will be used as monitoring wells. Roulette did not report any plugged or abandoned wells within the AOR. Federal regulations require EPA to review all wells within the AOR that may act as conduits for fluid migration into USDWs. If the fluid level in either of the monitoring wells rises to 450 feet below ground surface, the Permittee shall stop all injection into the Injection Well and will notify EPA in accordance with the Twenty-Four Hour reporting requirements set forth in Paragraph II.D.3.a. of the Draft Permit. Because Clara Field 11 and 19 (the two additional wells in the ½-mile area) will be used as monitoring wells for the proposed Clara Field 20 injection well, EPA has determined that these wells will serve as an added safety feature rather than potential conduits for fluid migration into USDWs.

c. As mentioned in Comment 13.b., above, Roulette did not report any plugged or abandoned wells within the AOR or even ½-mile from the wellbore.

d. Roulette's Permit Application includes extensive research about the stratigraphy of the confining and injection zones within the AOR. The Applicant utilized the analysis from gamma ray, caliper, deep resistivity, temperature, neutron porosity and bulk density logs from Clara Field 11, 19 and 20 to generate a stratigraphic representation of the AOR. This representation confirms that the Cooper 5-0, Sheffield 3-1, and Kane 3-0 formations in this area are flat and do not fold or twist. Research provided by the Applicant has shown that there are no faults or fractures within the injection zone. This research indicates that injection fluid is exceedingly likely to remain confined within the intended injection zone. See Page 26 of the Permit Application for further information.

14. COMMENT: *Increased inspection frequency minimizes impact due to well integrity failures. Operators are required to do so-called "mechanical integrity" tests at regular intervals, at least once every five years for Class 2 wells. In Texas, one violation was issued for every three Class 2 wells examined in 2010. Most well failures are patched within six months of being discovered, EPA data shows, but with as much as five years passing between integrity tests, it can take a while for leaks to be discovered. And not every well can be repaired.*

RESPONSE: In keeping with federal UIC regulatory requirements, all injection wells must have and demonstrate mechanical integrity prior to being placed into operation. The mechanical integrity test involves increasing the pressure in the casing, tubing, and annulus (the space between the injection tubing and long string casing) to a pressure above the maximum allowable surface injection pressure authorized by the permit. The pressure must be maintained over a period of 30 minutes to evaluate the mechanical integrity of the long string casing, tubing, and packer and to determine whether there are any leaks. Federal regulations found at 40 C.F.R. § 146.13(b)(3), and the Draft Permit itself, require mechanical integrity testing to be performed at least once every five years during the life of the well. In addition, mechanical integrity testing is required after the well has undergone any repairs, modifications, or rework. EPA will also receive and thoroughly review ROGC's Well Completion Report for this proposed Injection Well, which will include a review of all well construction information, an evaluation of the well logging, casing and cementing, and the results of all required mechanical integrity testing. EPA will thoroughly review the cement bond logs to further evaluate whether the well has been properly cemented, in accordance with 40 C.F.R §147.1955(b)(5) requirements, to prevent

injected fluid from flowing through the wellbore outside the casing. Even after a successful mechanical integrity test is conducted, the permit will require continuous monitoring of the injection well during its operation to verify its continuing mechanical integrity.

15. COMMENT: *The Application does not sufficiently describe ROGC's proposed monitoring and record keeping processes. According to data provided by States to the EPA, deep well operators are often caught exceeding injection pressure limits, and ROGC's Application does not provide adequate assurances that ROGC will not do the same.*

RESPONSE: Monitoring and recordkeeping requirements are outlined in Part II of Draft Permit. The applicable UIC regulations are also similar to most other federal regulations in that they require self-monitoring and reporting to a state or federal agency. EPA expects all operators to comply with all applicable regulatory and permit requirements, including recordkeeping requirement. An operator's failure to comply with applicable federal regulatory requirements or with the requirements of a federal permit, including provisions mandating recordkeeping, accurate monitoring and reporting to EPA, subjects that operator to potential civil or criminal penalties, or both. Each operator, including Roulette Oil and Gas, is further required to submit an annual report (EPA Form 7520-11) to EPA in which it must identify the surface injection pressure and volume of fluids injected into each injection well during each month in a calendar year. In addition, EPA inspects every Class II disposal well in Pennsylvania at least annually. EPA's diligent review of these required annual reports and its own injection well inspection activities are designed to supplement these self-reporting regulatory and permit obligations and further operate to encourage and assure continued operator compliance.

16. COMMENT: *Reckless permitting allows radiological contamination to persist in the environment. Once the environment is negatively impacted it is rarely restored. It is our responsibility (all peoples) to consider seven generations and leave quality fresh water for our grandchildren.*

RESPONSE: As noted in the response to Comment #10 above, even though individual constituents of injection fluid may be determined to be toxic, hazardous or radioactive, the fluid produced in association wih oil and gas production has been rendered statutorily exempt from hazardous waste regulation by Congress and is not classified as a hazardous waste under the RCRA. The UIC program, therefore, cannot regulate fluids produced in association with oil and gas production activities (Class II fluids) as hazardous waste. Disposal of these fluids by injection into a Class II brine disposal well, while regulated, is also legally permissible. EPA believes that the deep underground injection of fluids can be performed in a safe and environmentally protective manner and that deep underground injection is often safer than other available methods of handling and disposal. Furthermore, EPA is not engaged in reckless permitting. The goal of the UIC program is to prevent contamination of "underground sources of drinking water [USDW]" from the placement of fluids underground through injection wells. EPA, through the UIC regulations, advances and supports this goal by regulating the construction, operation, and closure of injection wells. These regulatory requirements ensure that injected fluids stay within the well and the intended injection zone, and that fluids that are directly or indirectly injected into a USDW do not cause a public water system to violate drinking water standards or otherwise adversely affect public health.

17. COMMENT: *The EPA should increase parameters that are required to be monitored in order for the permit to be granted. Additional pollutants of concern are Calcium, Phosphates, Nitrates, Potassium, Sulfates, Bromide and Strontium. Minimally, more analytes should be added to the monitoring requirements (i.e. 2,4,6-Trichlorophenol, 2-Butanone, acetone, acetophenone, benzene, ethyl benzene, glycol, methyl alcohol, o-Cresol, p-Cresol, phenolics, pyridine, surfactants, pH, turbidity, and conductivity) with increased frequency of testing for contaminants of concern (i.e. Cadmium, Chromium, Copper, and Radium).*

RESPONSE: 40 C.F.R. § 146.23(b)(1) requires "monitoring of the nature of injected fluids at time intervals sufficiently frequent to yield data representative of their characteristics". EPA believes that the analytical parameters listed in Paragraph II.C.4. of the Draft Permit are appropriate to characterize a Class II fluid and that the conditions found in Part II, Paragraphs C.3. and C.4. of the Draft Permit, are sufficient to properly characterize and to adequately monitor these fluids for injection purposes.

18. COMMENT: *Pressure used to force waste into UICs will increase seismicity and likelihood of earthquakes. Injecting fluid into sedimentary rock can produce bigger, more distant earthquakes than injecting into the underlying basement rock. Additionally, the USGS states: "Wastewater disposal wells typically operate for longer durations and inject much more fluid that is injected during the hydraulic fracturing process, making them more likely to induce earthquakes."*

RESPONSE: EPA must, and herein has, considered all appropriate geological data on the injection and confining zones associated with the Class II Injection well for which ROGC now seeks a Permit. While SDWA regulations for Class II wells do not require specific consideration of seismicity, EPA has nevertheless conducted a full and complete evaluation of the factors herein relevant to seismic activity. In conducting this evaluation, EPA researched, reviewed, considered and evaluated relevant issues such as the existence of any known faults and/or fractures in the AOR, any history of, or potential for, seismic events in the area of the Injection Well and other relevant factors. Those seismic factors reviewed, considered and evaluated by EPA are addressed and discussed in "*Region 3 framework for evaluating seismic potential associated with UIC Class II permits,*". An additional EPA report examining injection-induced seismicity ("Minimizing and Managing Potential Impacts of Injection-Induced Seismicity from Class II Disposal Wells: Practical Approaches," EPA UIC National Technical Workgroup, February 5, 2015) provides this Agency's standard operating procedure for assessing regional and local seismicity when reviewing UIC Class II permit applications.

In further response, EPA recognizes that the disposal of fluids through injection wells has the potential to trigger seismicity under certain conditions. However, induced seismicity associated with brine injection is uncommon, as the conditions necessary to trigger seismicity often are not present. Seismic activity induced by Class II wells is likely to occur only where all of the following conditions are present: (1) there is a fault in a near-failure state of stress; (2) the fluid injected has a path of communication to the fault; and (3) pressure exerted by the fluid is high enough and lasts long enough to allow movement along the fault line. The presence of a fault in a receiving formation creates a more vulnerable condition for a future seismic event. A fault is a fracture or crack in the rocks that make up the Earth's crust, along which displacement has occurred. Where a fault is present near an injection site, scientists believe that injection can

trigger seismicity when the pore pressure (pressure of fluid in the pores of the subsurface rocks) in the formation increases to such levels as to overcome the frictional force that keeps the fault stable. Pore pressure increases with increases in the volume and rate of injected fluid. Thus, the probability of triggering a significant seismic event due to injection, where the injection fluid reaches an active fault, increases with the volume and rate of fluid injected. In addition, as larger volumes of fluid are injected over time, the fluid can travel further within a formation, making it more likely that a fault could be intersected. When injected fluid reaches a fault, frictional forces that have been maintained within that fault can be reduces by the introduction of fluid. At high enough pore pressure, the reduction in frictional forces can result in the formation shifting along the fault line, resulting in a seismic event.

The Applicant submitted geological information indicating that the nearest inferred fault is located approximately 12,000 feet southeast of the Injection Well. This fault is also inferred to be in the much deeper Cambrian and Lower Ordovician Rocks rather than in the Upper Devonian section where the injection zones are located. The Applicant also provided information that there has not been any measurable seismic activity recorded in Potter County and this information has been confirmed by EPA. Nevertheless, requirements and provisions within the Draft Permit have been developed to prevent over-pressurization of the injection formation by limiting the surface injection pressure during the injection operations to 974 psi and the bottom-hole injection pressure to 1,683 psi. The permitted maximum allowable surface injection pressure and bottom-hole pressure were conservatively calculated to ensure that injection pressure will not propagate existing fractures or create new fractures in the formation. By limiting both the maximum allowable surface injection pressure and the bottom-hole injection pressure during injection operations, the proposed permit effectively seeks to prevent over-pressurization of the injection formation and the potential propagation of fractures that could: (a) create potential channels for fluid movement into USDWs; and/or (b) create conduits for fluids to travel from the injection zone to known or unknown faults during operation of the proposed injection well.

19. COMMENT: *The Application defines how wells are plugged, but there is no indication as to who is responsible for continuance of monitoring the Proposed Injection Well.*

RESPONSE: The Draft Permit specifies that "the Permittee shall plug and abandon the Injection Well in accordance with the EPA-approved plugging and abandonment plan in Attachment 1 and any EPA-approved modifications and/or revisions thereto." Within 60 days after plugging the Injection Well, the Permittee must submit a plugging and abandonment report to the EPA. The Permittee must also ensure that the report is certified as accurate by the person who performed the plugging operation. There is no requirement that there be continued monitoring of the Injection Well after the EPA has deemed the well as plugged and abandoned in accordance with federal and state requirements. However, EPA will have a field inspector present on site when the Permittee is plugging this Injection Well in order to observe the entire plugging process, operation and procedures. Only then will EPA make a determination as to whether the plugging of the Injection Well is adequate, sufficient and in compliance with all applicable plugging and abandonment requirements.

20. COMMENT: *President Biden has made a commitment to make environmental justice a part of the mission of every agency by directing federal agencies to develop programs, policies, and activities to address the disproportionate health, environmental, economic, and climate impacts on disadvantaged communities. Clara Township citizens*

have voiced their concerns and oppose the permit. If this Application for permit is approved, it raises the question of whether the granting of this permit is consistent with President Biden's environmental justice commitment where the views of the citizens of the local community are not taken into account.

RESPONSE: Consistent with EPA's environmental justice commitments and practices, EPA has employed and utilized its EJSCREEN tool to determine whether this proposed action may have Environmental Justice impacts on the community in the area where the action is proposed. EJSCREEN is an environmental justice mapping and screening tool that provides EPA with a nationally consistent dataset and approach for combining environmental and demographic indicators. EPA uses EJSCREEN as a preliminary step when considering environmental justice in permitting, enforcement and certain other situations. It is used to screen for areas that may be candidates for additional consideration, analysis or outreach as EPA develops programs, policies and activities that may affect various communities. While EPA recognizes that EJ Screening, itself, may not identify or determine the existence or absence of environmental justice concerns in a given location, does not provide an associated risk assessment and may have other significant limitations, EPA finds EJSCREEN to be a useful first step in understanding or highlighting locations that may be candidates for further Environmental Justice review. EPA's EJSCREEN of the area proximate to the proposed injection well site did not return results that indicated the likely presence of Environmental Justice issues or which indicated that any further assessment of potential Environmental Justice concerns should be performed prior to approving or disapproving this Draft Permit.

EPA is in full agreement that meaningful engagement is a vital part of every process it participates in. For that reason, EPA extended the public comment period an additional sixty (60) days. As part of the public involvement process, EPA will respond to the public comments submitted during the public comment period, as well as to the testimony provided at the February 2, 2021 public hearing. These responses will be made after careful deliberation of the issues raised. Ultimately a disagreement with respect to a proposed approach does not indicate that EPA failed to take into consideration the views of the community. Rather, it indicates that following consideration of that input, EPA proceeded with what it viewed as the best course of action.

21. COMMENT: *The proposed Permit should not be allowed to be modified to increase acceptance from other operators or unconventional wells.*

RESPONSE: The Draft Permit only allows the Injection Well to receive fluids from Roulette's oil and gas production operations. The Proposed Injection Well can receive flowback fluids from Roulette's unconventional wells if those fluids meet the definition of a Class II fluid. In the future, if Roulette would want to accept and inject fluids from other oil and gas operators into this injection well, Roulette would be required to submit a major permit modification proposal to the Agency that would necessitate EPA review and approval and would be subject to the same public notification and comment procedures (found at 40 C.F.R. § 124) as the current draft permit.